

Permit Amendment Source Analysis & Technical Review

Company	Midwest Sterilization Corporation	Permit Number	55557
City	Laredo	Project Number	314970
County	Webb	Regulated Entity Number	RN103376901
Project Type	Amendment	Customer Reference Number	CN602788465
Project Reviewer	Jean Shaw, P.E.	Received Date	April 16, 2020
Site Name	Midwest Sterilization Laredo Facility		

Project Overview

Midwest Sterilization Corporation (MSC), an ethylene oxide (EtO) sterilization plant, applied for a permit amendment to install three ethylene oxide sterilization chambers. MSC also proposed to increase daily and annual ethylene oxide usage rates and the number of charged ethylene oxide containers at the facility. In addition, MSC proposed to reference PBR 106.183 authorizing Boiler 3 in the permit. Furthermore, MSC proposed to account for the emission reduction achieved by the back vent dry bed system which was not previously represented.

Emission Summary

Air Contaminant	Current Allowable Emission Rates (tpy)	Proposed Allowable Emission Rates (tpy)	Change in Allowable Emission Rates (tpy)
ethylene oxide	8.38	6.31	-2.07

Federal Rules Applicability Requirement

Subject to NSPS?	No, NSPS does not apply since the site is not an affected facility under 40 CFR Part 60.
Subject to NESHAP?	No, the site does not emit any air contaminants regulated under 40 CFR Part 61.
Subject to NESHAP (MACT) for source categories?	Yes – Facility emits air pollutants subject to 40 CFR 63.
Subparts A & O	
Nonattainment review applicability:	Webb County is in attainment or unclassified for all pollutants. Therefore, nonattainment review is not applicable.
PSD review applicability:	The facility is not a named source, nor does it have the potential to emit greater than 250 tons per year of any pollutant. Therefore, PSD review is not applicable.

Title V Applicability - 30 TAC Chapter 122 Rules Requirement

Title V applicability:	N/A, the site is not a major source nor is it an area source subject to Title V.
Periodic Monitoring (PM) applicability:	N/A, this site is not subject to Title V.
Compliance Assurance Monitoring (CAM) applicability:	N/A, this site is not subject to Title V.

Process Description

The ethylene oxide sterilization process begins with the loading of palletized, non-sterile product into a designated preconditioning room under certain temperature and humidity. After preconditioning, the load is transferred sterilization chamber. Vacuum pumps are used to reduce the concentration of oxygen inside the sealed chamber. Nitrogen, steam, and subsequently ethylene oxide are introduced in the chamber and circulate the product in the chamber wrapped by hot

Permit Amendment

Source Analysis & Technical Review

Permit Number: 55557
Page 2

Regulated Entity No. RN103376901

water jackets. Later vacuum pumps are used to remove the ethylene oxide from the chamber and route it to the acid scrubber emission control system. Flush cycles are performed during the evacuation process to reduce the ethylene oxide concentration for safe chamber unloading. All chamber evacuations are vented to the acid scrubber.

As the sterilization chamber door is opened for product unloading, a vent on the opposite end of the chamber (the backvent) automatically activates an exhaust fan that pulls fresh warehouse air through the chamber during the entire unloading process. The backvent exhausts to the dry bed system before it is vented to the atmosphere.

The sterilized product is moved from the chamber to a heated aeration room where residual ethylene oxide is removed. The emissions are directed through a Safe Cell emission control system to reduce the ethylene oxide emissions to 1 ppm or less. When the aeration process is complete, the sterilized product is stored in the sterile area of the warehouse before shipment.

Project Scope

The affected emission source in the project is the scrubbers common stack (EPN. 1) which includes the emissions from the Acid Scrubber, Safe Cell Aeration Room Control System, and Sterilization Chamber Backvents. MSC proposed to install two 1,146 cubic feet ethylene oxide sterilization chambers and one 4,423 cubic feet ethylene oxide sterilization chamber. MSC also proposed to increase the number of charged ethylene oxide containers from 85 to 100, ethylene oxide daily usage rate from 4,286 lbs to 7,007 lbs and annual usage rate from 1,564,390 lbs to 2,557,555 lbs. The emissions from the chamber unloading process are routed to an acid scrubber with 99.63% reduction of EtO. The emissions from the chamber backvent are routed to safe cell emission control system with 99% control of EtO. In addition, MSC proposed to reference PBR 106.183 authorizing Boiler 3 in the permit. Special Condition Nos. 7 and 14 are updated to reflect the throughput and EtO storage increases. Special Conditions Nos. 19 and 22 are updated to authorize 3 new sterilization chambers and demonstrate initial compliance. Special Conditions Nos. 9, 10, 11 and 12 are updated to reflect represented control devices. Special Condition No. 21 is added to reference PBR for Boiler 3. Furthermore, MSC proposed to account for the emission reduction achieved by the back vent dry bed system which was not previously represented. Special Condition 22 is updated to require initial demonstration of compliance for the control represented. MAERT is revised to reflect the updated controls and emissions.

Best Available Control Technology

Source Name	EPN	Best Available Control Technology Description
Scrubber Common Stack	1	Acid Scrubber to reduce EtO from the sterilizing chambers for at least 99.63%. Chamber Exhaust Vent Control System reduces EtO from chamber backvents by 99%. Safe Cell Control Systems reduces EtO concentration from the aeration rooms to 1 ppm or less.

Permits Incorporation

Permit by Rule (PBR) / Standard Permit / Permit Nos.	Description (include affected EPNs)	Action (Reference / Consolidate / Void)
106.183	Boiler 3	reference

**Permit Amendment
Source Analysis & Technical Review**

Permit Number: 55557
Page 3

Regulated Entity No. RN103376901

Impacts Evaluation

Was modeling conducted?	No
Type of Modeling:	N/A
Is the site within 3,000 feet of any school?	No
Additional site/land use information: Surrounding land use is primarily industrial.	

Jean Shaw

E. Ann Mosher

	August 6, 2020		8/10/2020
Project Reviewer	Date	Team Leader	Date
Jean Shaw		Ann Mosher	